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WATER POLLUTION SURVEYS

OF THE

POLICE VILLAGE OF ST. JACOBS

TOWNSHIP OF WOOLWICH

1957 to 1964

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POLICE VILLAGE OF ST. JACOBS
(TOWNSHIP OF WOOLWICH)
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TD
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Report on water pollution
surveys, police village of St.
Jacobs, township of Woolwich /

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ONTARIO WATER RESOURCES COMMISSION

REPORT ON

WATER POLLUTION SURVEYS

POLICE VILLAGE OF ST. JACOBS

TOWNSHIP OF WOOLWICH

BY

DIVISION OF SANITARY ENGINEERING

OCTOBER 1957

JUNE 1961

MAY 1964

WATER POLLUTION SURVEY
POLICE VILLAGE OF ST. JACOBS

INTRODUCTION

This report relates to the results of a series of water pollution surveys conducted within the Police Village of St. Jacobs. In these surveys an attempt was made to locate all drains that discharge to a watercourse, determine the major contributors, sample the discharge for sanitary chemical and bacteriological analyses and estimate the volume being discharged at the time of sampling.

The OWRC conducts such surveys routinely for evaluation of any existing or potential sources of pollution. Recommendations are made pertaining to water pollution abatement, and when a sewage treatment works appears desirable, the Commission has a programme to aid in construction and financing of these works.

GENERAL

The village has a population of approximately 711, and is situated on Highway No.85, north of Waterloo. The Conestogo River bisects the village and receives drainage from the road-side ditches and storm sewers as well as from private drain outlets.

The major industrial and commercial establishments within St. Jacobs are:-

St. Jacobs Canning Co. Ltd.
Canada Felting Co. Ltd.
Hollinger Hardware Co. Ltd.
Snider Flour Milling Co.

There are two milk processing plants, St. Jacobs Creamery and St. Jacobs Dairy. As well as being employed by the aforementioned business concerns, many of the residents commute to the neighbouring municipalities of Elmira, Kitchener and Waterloo for employment.

WATER USES

There is no municipal system of water supply. Water for domestic use is obtained in most instances from individual dug or drilled wells.

The quality and quantity of the water from the few drilled wells in use is reported to be satisfactory, but many of the dug wells have a limited supply. During a dry summer several of the dug wells have been known to go dry.

Private Water System

There is one private water distribution system in the village that is owned by Mr. A. Good and serves 20 residences. This system is supplied by a 100-feet-deep drilled well.

Industrial Water Supplies

The St. Jacobs Canning Co. Ltd. is the only industry requiring a large volume of water. Their main source of supply is from the adjacent Conestogo River, but a spring supply is also used. The daily consumption is estimated to be 80,000 to 100,000 gallons.

Recreational and Agricultural Uses

There are no particularly designated swimming areas downstream of the village, but as the stream passes through agricultural areas it is used for cattle watering purposes.

Although the stream is not suitable to support such game fish as trout due to the warm, slow moving qualities, it is reported that some fishing is practised downstream from St. Jacobs.

WATER POLLUTION

Existing Conditions

There are no sanitary sewers or sewage treatment facilities. Most of the premises are served by septic tank systems. Four storm sewers and two private drains were located that discharge to the river. Prior to the establishment of the Waterloo County Health Unit, septic tank and cellar drain connections were permitted to the storm sewers. In some cases, due to insufficient space a connection to the storm sewer was the only alternative.

INDUSTRIAL WASTE DISPOSAL

Canada Felting Company Limited

Sanitary sewage from the plant enters a septic tank and is then discharged to the Conestogo River with the plant processing waste water.

St. Jacobs Canning Co. Ltd.

Untreated processing waste water, which includes cooling water, filter backwash wastes and water from apple washings and untreated sanitary sewage are discharged to the river.

A recent study of the waste water revealed that it has an excessively high organic content and the plant is, therefore, a major contributor of pollution to the river.

St. Jacobs Creamery

Waste water from the creamery operation discharges to a ditch at the rear of the premises and drains to the river. Due to the low gradient in the initial part of the ditch the water stagnates, thereby, producing obnoxious odours.

The waste discharge which has a high organic content is estimated to approximate 700 gallons per day.

St. Jacobs Dairy

Cooling water and milk processing wastes are discharged to the Church Street storm sewer.

Although no record is kept of the contaminated waste water volume, it is reported to be quite low, possibly in the neighbourhood of 100 to 200 gallons per day.

DISCUSSION OF SAMPLE ANALYSES

The laboratory results of bacteriological examinations and chemical analyses of samples collected during three separate surveys, October, 1957, June, 1961, and May, 1964, are included in Table I, which is appended to this report. The examinations and analyses were performed at the OWRC laboratory in Toronto.

Reference should be made to Figure I, a plan of St. Jacobs, for location of the sample points.

Interpretation of Analyses

Bacteriological Examination

The membrane filter technique is used to obtain a direct enumeration of coliform organisms. These organisms are normal inhabitants of the intestines of man and other warm-blooded animals. They are always present in large numbers in sewage.

The Commission's objective is a coliform density of not greater than 2,400 organisms per 100 ml. at any point in the receiving stream following initial dilution.

Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (ppm) and is an indication of the amount of oxygen required

for the stabilization of decomposable organic matter in the water. The completion of the test requires five days under a controlled incubation temperature of 20°C.

The Commission's objective for stream water quality is an upper limit of 4 ppm. Waste discharge concentrations should not exceed 15 ppm for 5-day BOD and suspended solids respectively.

Solids

The concentration of suspended solids is generally the most significant of the solids analyses in regard to stream water quality. The effects of suspended solids in water are reflected in difficulties associated with water purification, depositions in streams and injury to the habitat of fish.

Summary of Results

The Commission's objective of 15 ppm. for 5-day BOD and suspended solids of waste discharges should be compared to the appended sample results. This objective was exceeded at each sampling point.

The coliform concentrations were excessively high in the majority of the samples.

PROPOSED WATER AND SEWAGE WORKS

An engineering report has been prepared regarding proposed construction of a water works at an estimated cost of \$ 178,000 and a sewage works at an estimated cost of \$ 231,240.

To meet the Ontario Municipal Board requirements, the project was advertised in a local newspaper, the Kitchener-Waterloo Record, during July, 1964, outlining the scheme and the proposed water and sewer rates. A number of objections from ratepayers were received by the municipality and forwarded to the Ontario Municipal Board. As a result of the objections, a public hearing has been called for the near future.

INDUSTRIAL WASTE TREATMENT

St. Jacobs Canning Co. Ltd. is expected to proceed with the construction of a waste treatment system in the immediate future. The municipal sewerage system was not designed to serve this industry and it would probably be impracticable as it is operated on a seasonal basis and has large volumes of waste water with a high organic content.

SUMMARY AND CONCLUSIONS

Sample results exhibit the fact that contaminated waste water was discharging to the Conestogo River in the Village of St. Jacobs from four storm sewers and two private drains. An effective solution would be to proceed with the proposed sewerage system as many of the offenders cannot be corrected on an individual basis due to the lack of available space for an adequate treatment system.

RECOMMENDATIONS

It is recommended that the Township of Woolwich proceed with the installation of sanitary sewers and a sewage treatment system for the Police Village of St. Jacobs.

All of which is respectfully submitted,

District Engineer

A. B. Redekopp
for A. B. Redekopp, P. Eng.

Approved by

K. H. Sharpe
K. H. Sharpe, Director.

Prepared by:
A. C. Cooper.

TABLE I ANALYSES OF SAMPLES

<u>SAMPLING PT. NO.</u>	<u>LOCATION</u>	<u>DATE TAKEN</u>	<u>5-DAY B.O.D.</u>	<u>TOTAL</u>	<u>SOLIDS SUSP.</u>	<u>DISS.</u>	<u>COLIFORMS PER 100 ML. MEMBRANE FILTER</u>	<u>ESTIMATED FLOW</u>
GCO 121.8 DI	CHURCH ST. STORM SEWER	OCT. 29/57	102	674	30	644	100,000	
	" " " "	JUNE 5/61	12	488	28	460	290,000	
	" " " "	MAY 19/64	19	331	22	309	970,000	480 GAL/HR.
GCO 122.2W1	STORM SEWER OUTLET AT	OCT. 29/57	1780	3500	130	3370	10	
	WATER & ALBERT STREETS	JUNE 5/61	135	1250	138	1112	22,400,000	
	" " " "	MAY 19/64	18	508	22	486	620,000	550 GAL/HR.
GCO 122.25P	PRIVATE DRAIN OUTLET	OCT. 29/57	26	536	30	506	10	
	(DOMINION HOTEL)	JUNE 5/61	39	472	36	436	14,000,000	
	" " "	MAY 19/64	INSUFFICIENT FLOW TO SAMPLE					-
GCO 122.25P (1)	PRIVATE DRAIN OUTLET	OCT. 29/57	65	880	50	830	0	
	(CANADA FELTING CO.)	JUNE 5/61	6.8	334	32	302	11,000,000	
	" " "	MAY 19/64	11	396	14	382	180,000	300 GAL/HR.
GCO 122.27W	KING ST. STORM SEWER	OCT. 29/64	43	904	40	864	0	
	" " " "	JUNE 5/61	16	930	32	898	50,000	
	" " " "	MAY 19/64	47	1090	40	1050	11,900,000	180 GAL/HR.
GCO 122.3W	ISABELLA ST. STORM SEWER	OCT. 29/57	103	864	94	770	1,000,000	
	" " " "	JUNE 5/61	980	1502	444	1058	157,000,000	
	" " " "	MAY 19/64	3100	3596	1132	2464	107,000,000	15 GAL/HR.
GCO 122.21	ST. JACOBS CREAMERY EFFLUENT	OCT. 29/57	1032	3482	1482	2000	0	
	" " " "	JUNE 5/61	INSUFFICIENT FLOW TO SAMPLE					
		MAY 19/64	" " " "					

NOTE: ALL ANALYSES REPORTED IN PPM. UNLESS OTHERWISE INDICATED.

